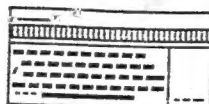


11260



LIST

LONG ISLAND SINCLAIR TIMEX GROUP
INCORPORATING * NYTSE OF NEW YORK CITY
ISSUE: November 1989



DISK DRIVES SUPPORTED:
1 OLIGER
2 LARKEN
3 AERCO

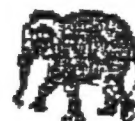
LIST MEMBERSHIP IS \$15.00. LIBRARY TAPES ARE AVAILABLE, WRITE THE
ADDRESS PRINTED BELOW.



LETTERS Letters LETTERS



TIPS TIPS TIPS TIPS



DISK DRIVES DISK DRIVES

L.I.S.T.
5 PERRI LANE
VALLEY STREAM, NY
11581



TO:

Don Lambert JAN/90
3310 Clover Dr. S
Cedar Rapids, IA
52404

UPPER RIGHT
CORNER OF
YOUR LABEL
IS DATE OF
LAST ISSUE.

FIRST CLASS MAIL
DATED MEETING NOTICE



FROM OTHER NEWSLETTERS;

LIST OFFICERS

PRES. HARVEY RAIT
TRES. ROBERT MALLOY
REC.SEC. STEVE KAYE
EDITOR. FRED STERN
LIBR. TOM SKAPINSKI

THE PLOTTER: NOV. 1989
WMJ DATA SYSTEMS HAS SOLD OUT
ALL ITS TS PRODUCTS TO RMG
ENTERPRISES. INCLUDED IN THE
BUY-OUT WERE 900 PCS OF SOFTWARE
FOR THE 1000 AND 2068, 300 BOOKS
A NUMBER OF TS1000, TS1016 AND T
S2040.

PLEASE SEND INQUIRIES TO:

LIST
MR. HARVEY RAIT
5 PERI LANE
VALLEY STREAM, N.Y. 11581

ZX-APPEAL: OCT. 1989
WORD IS THAT RMG ENTERPRISES IS
IN THE FINAL STAGES OF SECURING
THE PRODUCTION AND DISTRIBUTION
RIGHTS TO ALL OF THE HOUSE SOFT-
WARE TITLES FROM ZEBRA SYSTEMS.

PLEASE SEND SUBMISSIONS TO:

LIST
MR. FRED STERN
214 ROBERT ST.
HOLBROOK, N.Y. 11741

ZX-81, TS1000 TECHNICAL TIDBITS
IS ON SALE THROUGH LIST FOR
\$4.00. PURCHASE YOUR COPY AT
THE NEXT MEETING OR BY MAIL.

COMING EVENTS:

DEC. 10, 1989 LIST MEETING
DEC. 11, 1989 NYTSE MEETING
JAN. 14, 1990 LIST SWAP MEET AND
AUCTION

CLASSIFIEDS

THIS CLASSIFIED SECTION IS
AVAILABLE TO ALL LIST MEMBERS
FREE OF CHARGE.
THE ONLY RESTRICTION IS THAT
IT IS TO BE USED ONLY FOR THE
SEEKING, SELLING OR SWAPPING
OF SINCLAIR, TIMEX OR MICROACE
COMPUTER EQUIPMENT, PERIPHERALS
AND SOFTWARE.
LISTING, LIST, AND ITS OFFICERS
DO NOT ENDORSE, WARRANTY, OR
GUARANTEE ANY OF THE ITEMS
LISTED IN THIS CLASSIFIED
SECTION

NYTSE

NYTSE MEETS THE DAY AFTER THE
LIST MEETING.
7:30 PM.
MISS KIMS
PARK AVENUE SOUTH
BETWEEN 21ST. AND 22ST.

A FINAL WORD

MY NAME IS FRED STERN, AND I AM
THE EDITOR OF THIS EDITON OF
LISTING.
I WOULD LIKE TO THANK DONALD
LAMBERT FOR HIS MAJOR CONTRIBU-
TION TO THIS EDITON.
I ALSO THANK TOM SKAPINSKI AND
BOB GILDER FOR THERE CONTRIBU-
TIONS AND ASSISTANCE.
AND FINALLY, I THANK MR. AND
MRS. HAL BELLINSON FOR THERE
HOSPITALITY TO MY SON PAUL AND I
DURING OUR VISIT TO THERE HOME
IN TROY.

MEETING MINUTES NOV. 12, 1989

THE MEETING WAS CALLED TO ORDER
AT 2:05 BY HARVEY

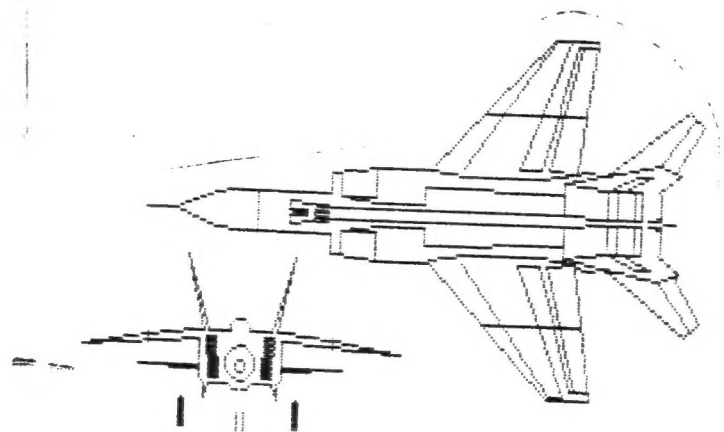
A FIRM AGREEMENT WAS MADE WITH
HAL BELLINSON FOR THE PURCHASE
OF HIS TIMEX EQUIPMENT BY LIST.
FRED STERN WILL DRIVE TO TROY
N.Y. TO FINALIZE THE SALE AND
PICK-UP THE EQUIPMENT.
A LIST MEMBER FROM QUEENS IS
CONTRIBUTING HIS TIMEX EQUIP-
MENT TO LIST. STONEY WILL PICK-
UP THIS EQUIPMENT.

BOB GILDER IS PURCHASING A
SCANNER FOR HIS CL. THIS ATTACH-
MENT WILL ALLOW BOB TO CONVERT
DOCUMENTS TO DISC.

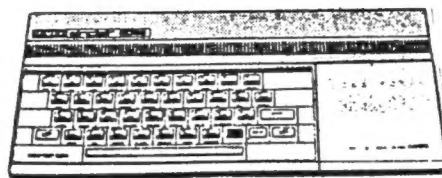
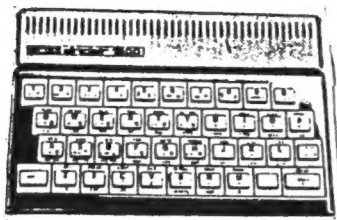
HARVEY READ LETTERS THAT WERE
RECEIVED SINCE THE LAST MEETING.

AUCTION - SWAP MEET

LIST WILL HOLD AN AUCTION -
SWAP MEET, JAN. 14, 1990
ADMISSION FOR THIS EVENT IS:
\$1.00 FOR MEMBERS
\$6.00 FOR NON-MEMBERS
NON-MEMBERS WHO JOIN LIST DURING
THIS MEETING WILL HAVE THE \$6.00
ADMISSION CREDITED TOWARDS THE
DUES. OR IN OTHER WORDS, WILL
BE ADMITTED FREE.
SEE PAGE 4 FOR FURTHER DETAILS.



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JANUARY 14, 1990

LONG ISLAND SINCLAIR TIMEX U.G.

AUCTION - SWAP MEET

PRINTERS PRINTERS PRINTERS

MONITORS MONITORS MONITORS

TS2068 TS2068 TS2068 TS2068

ZX81 ZX81 ZX81 ZX81 ZX81

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First the explanation. When I first got into the disk system on my TS 2068 I ordered my interface from Larken the first week of November of 1988 and I then ordered a pair of 80 track DS QD 5 1/4 TANDON full height drives from RMG with the assumption that the quad drives would read and LOAD 40 track files. I ordered a dual drive case and power supply from the editor of CATS that he had offered for sale. I had the drives and case for a long time before the disk interface came in the latter part of January 1989 and I learned that the quad drives while some could use them to read and load 40 track would not do so for me. So I ordered a 5 1/4 40 track full height drive and case and power supply from RMG and when they came I got involved with using a disk system. I ended up with the single drive sitting on top of the dual drives and all three could be used.

Then at Collins Radio Inventory Disposal Store I saw disk drives for sale, \$10.00 for what maybe good drives and \$5.00 for ones tagged with defects. I bought 6 that day that were TANDON TM-100-2A DS DD 5 1/4 40 track and had three working drives and three that gave errors on trying to read the directory. But in the process of testing the drives I had the power supply for the single drive case go out. Also the 40 track drive and 80 track drive in the dual case wouldn't work. After a lot of fretting and trying I got the 80 track drive out that I had taken out of the single drive case to use to test the drives and got my disk system up and going. I thought that there was something wrong with the two drives I had bought from RMG. I could not figure out what had happened to the power supply so I stored it away.

Then later at the Collins Inventory disposal Store I eyed a bunch of drives and picked out six and got a firm price of \$20. for the lot. All had tags on them. And some had parts missing which I figured I could swap around since all including the prior six were TANDON TM-100 DS DD 5 1/4 40 track drives. I did manage to sneak them into the house and get them hid before Masako, my wife, saw them. I bought them with the idea of having spare parts and also of combining some to make a complete working drive. I also received in the mail information in the form of most of the TANDON manual and part of an IBM repair manual since the drives I had gotten at the Collins Store were all out of IBM computers that were surplus when they went to hard disk.

Then recently I was at the Collins Store and there were parts and pieces of 3 more drives which I invested (\$3.50) in for a couple of spare doors which a couple of the other drives had either a broken one or else was completely missing. And again I snuck in the drives but my wife has been on me about cleaning up the basement so I had to whittle away at my horde of stuff to make it look like it was less or at least the amount I threw away could be seen.

I tried to use the dual disk drive case to test the drives but it was too awkward and I couldn't easily do it. So back to the single drive case with the bad power supply. Luckily it was a power supply that used 78XX regulators. I checked the bridge rectifier and it seemed to be O. K. When I reversed the leads on the output on the A. C. range of the multitester one way read no voltage while the other had an acceptable voltage. So I went to the power supply plug to the disk drive and got 8 volts on the 12 volt pins and -2 volts on the +5 volt pins. I called one of the group and he talked about oscillation and when I checked I could find no A. C. on the output so I was puzzled. Then at the Collins Store last Tuesday I saw Gary (he is a test technician) and I asked him. He said it sounded like something was wrong with the negative side of the power supply. He would start at the transformer and work to the disk drive plug in connector looking for cracks in the board, bad solder etc and if he didn't see anything then he would use jumpers and cover every bit of lead till he found it.

Using his advice I found that the solder joints on the bridge rectifier looked shaky, two legs had the solder wicked up the legs like a good solder joint but two had the solder repelled by the legs of the bridge. One was an A. C. input and the other was the negative output. After I resoldered the

joints the voltages changed. The 12 volts was 12 volts but the 5 volts was a trifle was then 3 volts. The power supply had 4 regulators on it two 7805 and two 7812 and from that I concluded that the 7805s had quit. A disk drive plugged into the power supply only would run as soon as the power supply was turned on.

The little circuit board was mounted by the top of the bridge against the end of the drive case and the four regulators in a row bolted down to the bottom of the case. The 7805 regulators were in the center of the four so I made a spacer out of plastic to bolt the regulators to to maintain the spacing while soldering. I used as little heat as possible to get the bad ones out and cleaned out the holes with a fine drill in a pin vise, mounted the regulators and soldered them in. Power up gave me 12 volts D. C. and 5 volts D. C. and a drive plugged in did not run on turn on.

I made up a single drive interface cable and plugged the drive in and I had to turn the connector over to get it to run right but oh boy! the drive acted up just like it did on the good power supply. But a working drive functioned beautifully on the tryout. Now I had the single drive power supply working. And it was ideal for testing drives because with the cover off the case it left a sheet of metal with the power supply on the back end. And that meant I could easily access the drives to make adjustments.

The first thing I did was check and reset the speed of the drive motor. For that you will need a fluorescent light and a small bladed screwdriver to turn the adjustment screw in the potentiometer on the board on the end of the drive and you will need a jumper, a piece of insulated wire with a flea clip on each end to go between the square pins on the top board. With the disk drive on the table top side up and the drive insertion door facing you, you will find a square pin located just to the right of the left hand board mounting screw by 5/16 of an inch and about a 1/16 of an inch closer to you than the screw and labeled TP10 with the letters upside down. Fasten one end of the flea wire with the flea clip to the square pin. Up at the other end of the board is a row of connectors and the one labeled 11 will be directly in line with the square pin TP13 which is 5/8 inch this side of the connector. Fasten the other end of the wire using the flea clip to that square pin. The purpose of the wire is to cause the disk drive motor to turn on when you turn on the power. Speed is best set with a disk in the drive. I set the speed before I connected the interface cable to the drive. Now with the drive power cord plugged into the disk drive turn the disk drive on its side to expose the flywheel of the disk spindle with the paper and the bars printed on it exposed to the fluorescent light and watch the outer ring (60 cycle) and if the bars are seeming to go either clockwise or counterclockwise then turn the screw in the end of the potentiometer on the back board (the motor drive board). The bars may waver but unless there is a definite movement in either direction the drive speed is correct. One word of caution ** IF THERE IS NO TERMINATOR RESISTOR IN THE SOCKET LOCATED BETWEEN THE TWO I. C. S IN LINE LEFT TO RIGHT WITH TP13 NOT ONLY WILL IT BE IMPOSSIBLE TO SET SPEED BUT ALSO IMPOSSIBLE TO SET THE TRACKING **. I had a drive that just seemed to want to vary the speed and also would not take a track adjustment until I realized that the resistor was missing. A word of caution, it might be safer to wrap masking tape on the screw drive blade to insulate it. When the speed checks right remove the jumper between TP10 and TP13.

To reset the track if the drive will not read track 0 (the directory of files) you will need a larger screw driver (insulate with tape the blade and shaft) and an allen wrench size .109 or 7/64 of an inch. Turn the drive over and you will see down near the disk flywheel a pair of allen screws which are sealed on the side with green sealing material. Loosen the two screws and turn the drive back right side up and on the back of the drive above the disk motor board is a metal projection that has a slotted screw head in an oblong opening and with the drive door facing you the slotted screw will be on the right side of the metal projection. To the left and slightly towards

you is another allen headed screw also with the green goop on the side of the head. Loosen that screw and test with the screw driver to see if the turning the screw moves the metal a trifle. The screw only has about a 180 degree adjustment. I had the best luck adjusting by turning the screw to the most counterclockwise position. The reason to insulate the screwdriver is to prevent touching the bare pins that stick out above the adjusting screw. Now with the interface cable plugged in and the drive power supply plugged in select a disk SAVED on a good drive (be sure to use a copy in case something happens to the disk) and first try to CAT the disk (I was using a TS 2068 and a Larken interface) when you get an error watch the metal slide and just turn the screw enough clockwise so that you see it barely more. Then once more retry the CAT and repeat till suddenly the entire directory is listed as it should. I usually made one or two very slight more adjustments and then tried to LOAD a file on the first of the directory and then one on the last of the directory. If both had LOADED on a good drive and they LOAD on this one then power down and tighten the three allen screws and then retry the CAT and the first program and the last program. If they LOAD you have it reset. With the Larken and the TS 2068 on failure to CAT you will get a CRC error and then garbage for the directory. Then as you get close to the track with the adjustments you might see one or two of the first files named then garbage, then suddenly all files appear. While the drives are rather mysterious (to me) in how they work it is rather more mechanical to make the adjustments. Of course other defects are handled differently.

I have one drive in which the track 0 switch is off. What it does is give a series of thunking sounds as it tries to read track 0 and I have clues to how to reset it. I will try it maybe I will have another good drive. I do have one drive with a bad head or else the head is connected wrong, but to all practical purposes it is a SS DD 40 track drive.

When I started this repair/adjusting sequence I had a total of 18 drives (some with parts missing) and now I have the original 3 I bought from RMG that are working plus 5 more working drives plus 1 working drive and 1 drive that wouldn't CAT that I sent to Tony in Australia for his Larken ZX81 for spares. And 6 drives that do not work, some have parts missing. 1 drive has been tossed in the out going trash (it had most parts missing). The easiest fix was the replacement of the disk door which was missing on one drive and broken on another drive. But that means some of the none working drives are doorless. The drive that is SS DD was one of several that had the top head missing. I tried to move a head from a different drive but either it was a bad head (I suspect that since it will not FORMAT a disk or read a disk on one head that it is a bad head) or else the head is not properly aligned in the track like the other head is. There was a time I would have bought a SS DD 5 1/4 drive but now I am not sure I would want to keep this drive. At present it is set up in the single drive case and power supply.

Timex Sinclair Users Group

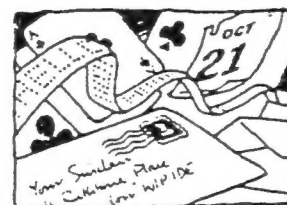
Mile High Chapter

PROGRAMMING TIP FOR OCTOBER:

Do you have a Program that Auto runs and is in machine code so you can't BREAK it? Here's a way to stop Auto-run. In the immediate mode type this:
SAVE CHR\$USR 832" name "
 This will first LOAD the named Program and then immediately start to SAVE. Press BREAK at that point. This stops the SAVE and allows you to see how the Program gets into machine code. Here is how it works: USR 832 calls the ROM LOAD subroutine and the two quotes hold the Program name. You can also type " " with no Program name. After LOADING the USR call RETURNS to BASIC to finish the line, evaluating to zero. CHR\$ changes the zero into a string. The line then reads:

SAVE " " [CHR\$ of 0 is a space] and the computer SAVES the Program.

Thanks to SYNTAX for this Programming tip.



AUDIO TRASFORMER LOAD AID

Article by Donald S. Lambert

3310 Clover Drive S. W.

Cedar Rapids, IA 52404 Please send SASE.

So you got that new software and just can't wait to LOAD it but try as you might it does not LOAD. And when you listen to it you think it sounds O. K. but the program just will not LOAD. So you mutter about the unreliable cassette system and give up. But you have tried everything to try to LOAD the program. And would try most anything to LOAD it. I know the feeling, I had 9 cassettes of software from various users groups that all I could get to LOAD was maybe one program from each cassette if that much. And then I read a line of information in a publication of Bill Harmer of Ottawa.

The following appeared in "Tips, Tricks And Techniques Of The User Group Masters For the Sinclair ZX-81/Timex TS1000" VERSION 0.14 by Bill Harmer, Ottawa.--- An audio output transformer may be used between the cassette on play and the computer with the 8 ohm side to the ext. speaker and the high-Z side to the computer (Radio Shack Part No. 273-1380 (less than \$2.00), the 8 ohm side has 2 leads the other three). This has been recommended for the use with the TS2068 in baulky LOADING or upLOADing of ZX-81 programs.

Looking through my box of transformers I found a 500 ohm to a 1000 ohm transformer and hooked it up sort of breadboard fashion and tried one of the nonLOADing cassettes and one program after another LOADED successfully. However a few did not LOAD and it was obvious that there was not enough output to be a successfull LOAD. About that time I was looking for a 15 volt A. C. transformer and remembered an old transistor radio that was also a 110 volt A. C. model only and so I got it out of the junk box and the transformer I remembered was an audio transformer with one side going to an 8 ohm speaker so it was 8 ohms on one side and I would guess 1000 ohms or close to that on the other. And physically it is considerably larger in size than the Radio Shack one so I tried it. The output was several levels higher than on the 500 to 1000 audio transformer. I was using a LOAD AID (see newsletter CRABIST March/April #3 for construction article) but the meter was not calibrated in volts. Reading in the TS 2068 Technical manual I see the TS2068 looks for a voltage of -2.0 to +5 volts on the EAR input jack. With a peak allowed voltage of +5.0. Now I needed to calibrate the LOAD AID so that full scale was +5. volts.

With the LOAD Aid in the circuit and also an A. C. meter accross the input to the EAR I played a tape (not plugged into the computer) until I got approximately full scale reading on the LOAD AID while the A. C. meter recorded 5 volts. Afterwards I realized that I could have used a 6.3 volt transformer and put a potentiometer in the circuit and adjusted the pot to give 5 volts A. C. and then by trying different resistor combinations got the LOAD AID to give full scale reading. With that combination I got the following data. I have not tried this signal booster on the ZX81 but it should work and while the TS 2068 seems to like the higher output the ZX81 has an upper limit where increased signal strength will cause a LOAD default. Also note that the tape that I used was a tape that would normally LOAD without any signal enhancement so a poorer quality tape will possibly have a lower output.

Also I have learned that a marginal tape will LOAD on one day and not another, part could be the problem of the cassette routine being bothered by the warming up of the chips and part by a fluctuating house currents. I suspect the former has more bearing on the case. I was LOADING the tapes that would not LOAD normally with the tape player with the volume set at 10 but with the volume set at 4 and using the transformer the programs LOADED. And that leaves considerable margin so the non-LOADing programs still may LOAD if I try again. Needless to say I now have a lot of new to me software to work with.

In actual practice I found that I got the majority of the programs to

LOAD but I had to use the maximum of 5 volts A. C. to do that. I am quite pleased at the success rate and once LOADED I immediately SAVED to Larken disk. Now the programs are easily accessible.

VOLUME	LOAD	TRANS-	PROGRAM	COMMENTS
SETTING	AID	FORMER	LOADED	
TAPE	READING	USED	Y/N	
PLAYER	50 IS	Y/N		
	5 VOLTS			
	A. C.			

3.0	! 0	! N	! N	!
3.0	! 8 - 11	! Y	! N	! READ HEADER
3.5	! 0	! N	! N	! *****
3.5	! 12 - 14	! Y	! Y	! * !-CASSETTE PLAYER--!
4.0	! 0	! N	! N	! * ! 8 OHM
4.0	! 14 - 17	! Y	! Y	! * !
				! * () () () () ()
4.5	! 0	! N	! N	! * -----
4.5	! 15 - 20	! Y	! Y	! * -----
				! * () () () () ()
5.0	! 0	! N	! N	! * !
5.0	! 18 - 22	! Y	! Y	! * !
				! * 1000 OHM
5.5	! 0	! N	! N	! * !-----METER-----!
5.5	! 20 - 24	! Y	! Y	! * !
				! * !---COMPUTER EAR--!
6.0	! 0	! N	! N	! *****
6.0	! 23 - 27	! Y	! Y	!
6.5	! 0	! N	! N	!
6.5	! 26 - 32	! Y	! Y	!
7.0	! 5	! N	! N	! READ HEADER
7.0	! 35 - 40	! Y	! Y	!
7.5	! 7 - 10	! N	! Y	!
7.5	! 46 -50+	! Y	! Y	! EXCEEDS 5 VOLTS!
8.0	! 14 - 17	! N	! Y	!
8.0	! ! ! ! !	! ! ! ! !	! ! ! ! !	! NOT TRIED
8.5	! 18 - 22	! N	! Y	!
9.0	! 20 - 23	! N	! Y	!
9.5	! 20 - 24	! N	! Y	!
10.0	! 20 - 24	! N	! Y	!

This is almost self explanatory but for those that don't have any electronic experience I can explain a little. I will admit that I am not a guru so I could make gross errors in my explanation. So beware! If you are not sure seek out someone more knowledgeable or write to me with your questions.

If you have an audio transformer and wonder if it is about the right value and have a multimeter you will find the 8 ohm windings will have very

low resistance like .54 ohm to 2 or 3 ohms and the 1000 ohm side will be of the order of about 66 ohms. Note most audio transformers are rated at their resistance (impedance) at a specified frequency such as 1000 hertz. The low resistance windings go to the tape player and the higher resistance windings go to the computer. If there are more than four connections then the windings are center tapped and you will use the highest resistance readings for the connections.

The only reason for connecting a meter across the output is to make sure that you do not input over 5 volts into the computer. Over five volts on either the ZX81 or the TS 2068 could zap the SCLD or the ULA chip. Any meter that is sensitive enough to read full scale on 5 volts can be used. You will need an A. C. meter but a D. C. meter can be made into an A. C. meter by connecting a diode (any of the 1N4000 series would be ideal) in series (if the meter tries to read to the left or down scale reverse the diode) to rectify the AC to DC and if the meter reads off scale put resistors in series with the diode and the meter. I am using a 50 microampere meter which is very sensitive and requires a lot of resistance to get five volts full scale. Or you could put jacks on the case of the transformer signal booster and use a multimeter set to the five volt or near five volt A C range. I just happened to have the meter in my LOAD AID so I recalibrated it to give 5 volts A C full scale.

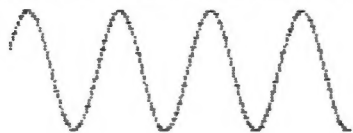
I did buy a Radio Shack 273-1380 audio transformer (8 ohm to 1000 ohms) and make up another transformer aid and the results are so close to the prior chart that the transformer I used must have been an 8 ohm to 1000 ohm one. However, in physical size the Radio Shack version is very much smaller. I may use the Radio Shack transformer in a circuit to make an electronic signal booster that Fred Nachbaur designed. The transformer I have is not center tapped but the Radio Shack one is and the circuit calls for a center tapped model.

From
Harvey Pulliam

HAVE A HAPY HOLIDAY

LOOK TO THE HILLS

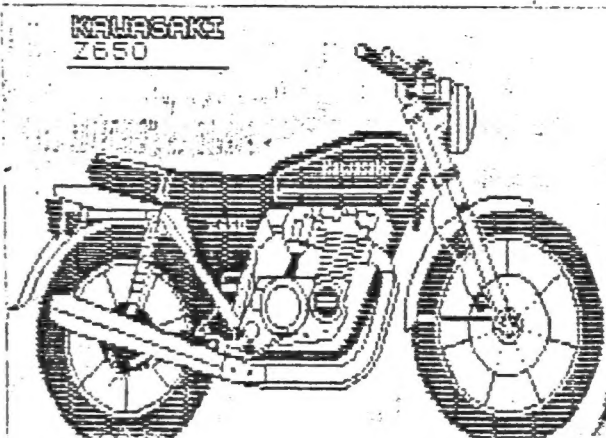
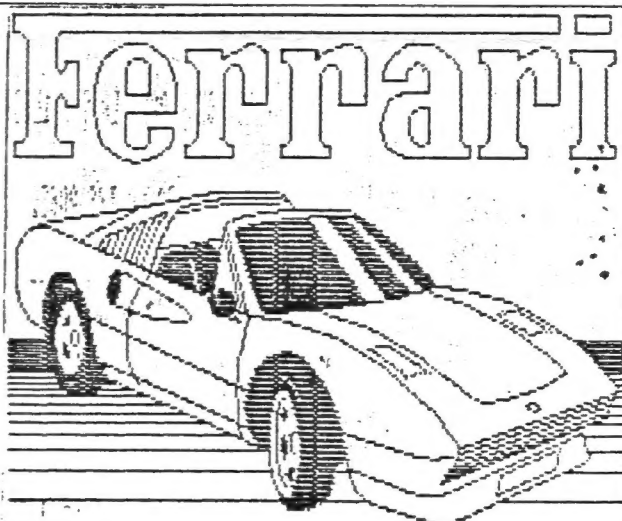
WHERE HELP COMES FROM!



```

3 REM SINE WAVE
8 PRINT AT 3,6;"HAVE A HAPY H
OLIDAY"
10 PRINT AT 5,7;"LOOK TO THE H
ILLS "
20 PRINT AT 7,5;"WHERE HELP CO
MES FROM!"
70 FOR I=-20 TO 20 STEP .03
80 PLOT I*6+127,87+20*SIN I
90 NEXT I

```



Fight your way to the north pole in Arctic Explorer. There are ten screens to be negotiated en route. Each contains different hazards such as rockfalls, rolling snowballs, snowmen, crevasses and crumbling ice. Move left with O, right with P, jump left with CAPS SHIFT and O, jump right with CAPS SHIFT and P.

Written for the Spectrum or Spectrum Plus by Neil Bates of Coventry.

Underlined letters are those to be entered in graphics mode.

u>

```

1 LET hi=0: LET n=3000
10 GO SUB 9000: GO SUB 9050
25 CLS: GO SUB 8000+(s*10): G
O SUB 9500
40 LET b=b*(2)+b*(1): LET t=t
-(t*0): PRINT AT 15,12: PAPER 0
; INK 5; BRIGHT 1;t: " ": BEEP .0
1,-10: GO SUB 1000+(s*100): LET
b=b+(INKEY$="p")-(INKEY$="o"
AND b): IF INKEY$="P" THEN L
ET q=1: IF b<29 THEN GO SUB 400
O
75 IF INKEY$="O" THEN LET q
=-1: IF b>2 THEN GO SUB 4000
80 PRINT AT a,b;b*(1)
90 IF b >= 31 THEN LET s=s+1:
FOR f=1 TO 50: OUT 254,59: OUT
254,200: NEXT f: LET b=0: LET sc
=sc+t+100: LET t=100: GO TO 25

100 GO TO 40
1100 LET a$=a$(193 TO 224)+a$(1
TO 32)+a$(33 TO 64)+a$(65 TO 96)
+a$(97 TO 128)+a$(129 TO 160)+a$
(161 TO 192)
1110 PRINT AT 0,0: INK 0;a$: IF
a$(193+b) <> " " THEN GO TO n

1130 RETURN
1200 LET a$=a$(2 TO 32)+a$(1)+a$
(34 TO 64)+a$(33): PRINT AT 5,0
;a$: IF a$(33+b) <> " " THEN GO
SUB 8023: GO TO n: IF ATTR (a+
1,b)=56 THEN GO SUB 8023: GO TO
n
1240 RETURN
1300 IF RND >.45 THEN LET a$=a
$(2 TO 32)+a$(1)+a$(34 TO 64)+a$
(33): GO TO 1320
1310 LET a$=a$(32)+a$(1 TO 31)+a
$(64)+a$(33 TO 63)
1320 PRINT AT 5,0;a$: IF a$(33+
b) <> " " THEN GO TO n
1340 RETURN
1400 IF RND >.5 THEN IF z=0 TH
EN LET v=7: LET j=INT (RND *2
7)+3: IF ATTR (7,j)=61 THEN LE
T z=1
1410 IF z=1 THEN PRINT AT v,j:
" ": AT v+1,j: INK 5: PAPER 7;"K
": LET v=v+1: IF v=9 THEN PRINT
AT 9,j: " ": LET z=0
1420 PRINT AT a,b: " ": IF ATTR
(a+1,b)=56 THEN GO TO n
1430 RETURN
1500 GO SUB 1300: RETURN
1600 PRINT AT a,b: " ": IF ATTR
(a+1,b)=56 THEN GO TO n
1620 RETURN
1700 GO SUB 1600: GO SUB 1200: R
ETURN
1800 GO SUB 1700: RETURN
1900 GO SUB 1300: GO SUB 1600: R
ETURN
2000 PRINT AT a,b: " ": IF ATTR
(a+1,b)=56 THEN GO TO n
2020 IF b >= 25 THEN GO TO 2500

2030 RETURN
2500 PRINT AT a,b;"AP": RESTORE

```

```

,9900: FOR f=1 TO 32: READ a,b:
BEEP a/3,b: NEXT f: LET sc=sc+50
0: PRINT AT 10,12: INK 0: FLASH
1;"BONUS =500": AT 8,12: INK 2:
"WELLDONE"
2540 FOR f=1 TO 20: BEEP .01,f+3
0: BEEP .01,f+2: NEXT f
2550 LET a=6: LET b=0: LET s=1:
LET l=1+1: GO TO 20
3000 PRINT AT a,b: INK 2;"A": L
ET l=1-1: IF l=0 THEN GO TO 380
0
3010 RESTORE 9900: FOR f=1 TO 6:
READ a,b: BEEP a/2,b: NEXT f
3020 LET a=6: LET b=0: GO TO 25

3800 RESTORE 9900: FOR f=1 TO 6:
READ a,b: BEEP a/1.5,b: NEXT f:
PRINT AT 12,11: INK 7: FLASH 1
; BRIGHT 1: PAPER 0;"GAME OVER"

```

```

3810 IF sc>hi THEN LET hi=sc: P
RINT AT 9,0: INK 5: PAPER 0: BR
IGHT 1;n$: AT 9,8;"A NEW HIGH SC
ORE": FOR f=20 TO 40: BEEP .01,f
: BEEP .01,f-20: NEXT f
3820 RESTORE 9910: FOR f=1 TO 25
: READ a,b: BEEP a/4,b: NEXT f

```

```

3830 FOR f=4 TO 7: PRINT AT 21,

```

```

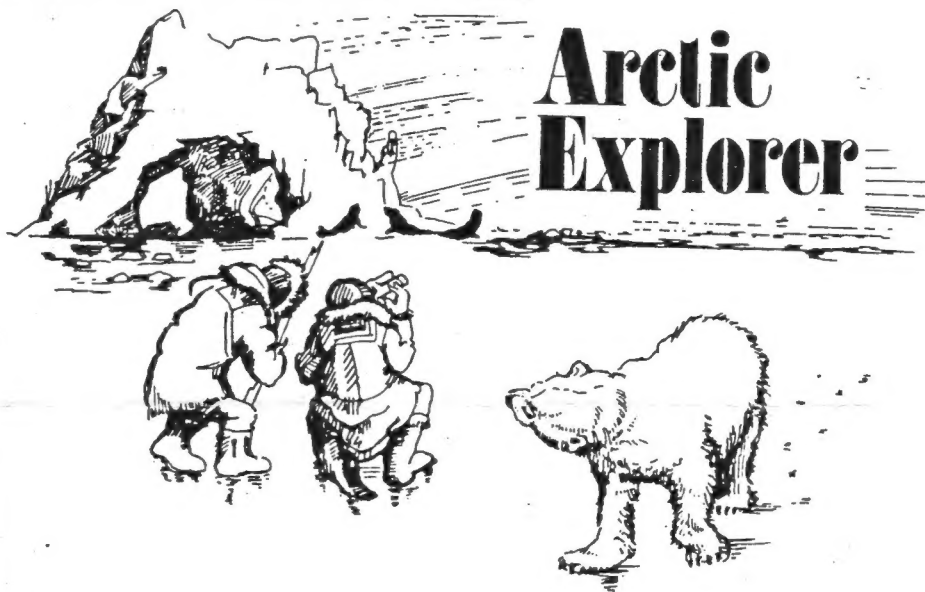
,12;"K": AT 7,15;"KKKKKK": AT 7,
22;"KKKK": AT 7,27;"KKKK": RETU
RN
8070 GO SUB 8061
8072 DIM a$(64): LET a$(10 TO 11
)=""LM": LET a$(42 TO 43)=""NO"
8073 RETURN
8081 GO SUB 8020: PRINT AT 7,0:
n$: GO SUB 8061: RETURN
8090 GO SUB 8030: PRINT AT 7,0:
n$: GO SUB 8061: RETURN
8100 PRINT AT 7,0: INK 5;"KKKKK
": AT 7,7;"KKK": AT 7,12;"K": AT
7,14;"KK": AT 7,17;"KKK": AT 7,
22;"KKKKKKKKKK": RETURN
9000 RESTORE 9920: FOR f= USR "a
" TO USR "p"+7: READ a: POKE f,
a: NEXT f: RETURN
9051 LET b$=""AB": LET l=5: LET a
=6: LET b=0: LET sc=0: LET s=1:
LET t=100: LET n$=""

```

```

": RETURN
9510 FOR f=12 TO 21: PRINT AT f
,0: PAPER 0;n$: NEXT f: RESTORE
9960: FOR f=1 TO 5: READ x,y,q:
PRINT AT x,y: INK 6: BRIGHT 1:
PAPER 0;x$: NEXT f: FOR f=1 TO
5: READ x,y,q: PRINT AT x,y: BR
IGHT 1: PAPER 0: INK 5;q: NEXT f
: RETURN

```



Arctic Explorer

```

O: INK f: PAPER 0: BRIGHT 1;" P
RESS ANY KEY FOR ANOTHER GO ":
PAUSE 10: IF INKEY$="" THEN N
EXT f: GO TO 3830
3840 GO TO 10
4000 RESTORE 9950: FOR f=1 TO 6:
READ x,y,m: PRINT AT a,b:" ":
LET a=a+y: LET b=b+m: PRINT AT
a,b;"A": BEEP .001,x: NEXT f
4020 RETURN
5000 GO SUB 4000: PRINT AT a,b:
" ": LET b=INT b-1: IF b>21 THE
N IF a <= 6 THEN GO TO 50
5005 LET a=6: GO TO 3000
8010 DIM a$(224): FOR f=1 TO 15:
LET c=INT (RND *190)+1: LET a
$(c)=CHR$ (INT (RND *2)+148):
NEXT f
8011 PRINT AT 7,0: PAPER 7: INK
5;"KKKKKKKKKKKKKKKKKKKKKKKKKK
KKKK": RETURN
8020 GO SUB 8023: GO SUB 8011
8022 RETURN
8023 DIM a$(64): LET a$=""

```

```

LM LM LM
NQ NQ NQ
": RETURN
8030 LET a$="" GH
IJ
": GO SUB 8011: RETURN
8040 LET j=10: LET w=0: LET z=0:
GO SUB 8011: RETURN
8050 GO SUB 8030: LET a$(20 TO 2
1)=""GH": LET a$(52 TO 53)=""IJ":
RETURN
8061 PRINT AT 7,0: INK 5;"KKKK"
; AT 7,5;"KKK": AT 7,9;"K": AT 7,

```

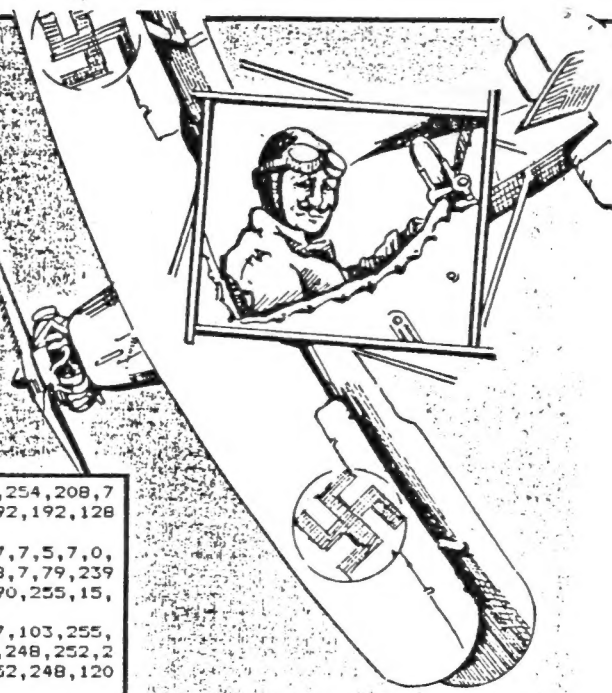
```

9900 DATA 1,5,1,5,1,2,5,4,5,2,
2,0,1,7,5,7,5,2,5,2,5,4,5,2,
2,7,2,0,1,7,5,7,5,5,5,2,5,5,
1,2,2,5,2,7,2,0,2,1,2,5,4,5,
2,1,0,1,7,1,5,1,2,2,0
9910 DATA 2,7,1,9,5,11,5,12,2
5,14,25,16,25,14,25,12,15,11
,5,12,125,14,125,16,125,14,
125,12,125,11,125,12,125,11,
125,9,2,7,1,9,1,1,2,12,1,11,1,
2,3,14
9920 DATA 28,28,8,127,28,28,20,2
0,28,28,8,28,62,93,20,34,114,116
,40,112,112,112,114,62,78,46,20,
14,14,14,78,124,48,124,190,255,2
51,118,126,60,32,12,12,0,0,102,3
9,3
9930 DATA 3,7,13,15,6,3,1,15,192
,224,176,240,96,192,128,240,31,5
5,99,51,19,6,12,24,248,236,198,2
04,200,96,48,24
9940 DATA 0,255,255,187,179,19,1
,1,7,25,55,111,127,255,255,254,2
24,248,252,254,254,63,223,221,25
4,191,191,127,127,63,31,7,125,25
1,251,246,206,60,248,224,40,44,4
6,40,32,32,32,32
9950 DATA 16,-1,0,18,-1,0,20,0,q
,22,0,q,22,1,q,20,1,0
9960 DATA 13,3,"LIVES",15,20,"LE
VEL",15,3,"BONUS",17,3,"SCORE",1
9,3,"HI-SCORE",13,12,1,15,12,t,1
7,12,sc,19,12,hi,16,22,s
9970 DATA -45,-53,-34,-61,-21,-6
7,-7,-70,7,-70,21,-67,34,-61,45,
-53,34,-61,21,-67,7,-70,-7,-70,-
21,-67,-34,-61,200

```


DOG FIGHT

Shoot down the red baron before he can hit you. This is the challenge in Dog Fight, written for the Spectrum or Spectrum Plus by Neil Bates of Coventry. Underlined letters are those to be entered in graphics mode.



```

1 POKE 23676,250: POKE 23675,
0
2 GO SUB 500
5 GO SUB 3000
10 DIM y(2): DIM x(2): LET sc=
0: DIM m(2): LET a$="01234567":
LET b$=a$: LET x(1)=5: LET y(1)=
5: LET x(2)=15: LET y(2)=10: LET
f=0: LET a=5: LET b=5: LET c=10
: LET d=15: LET t=100
30 PAPER 0: BORDER 0: INK 7: C
LS : FOR f=3 TO 13: PRINT AT f,
3: PAPER 5:
": NEXT f
40 PRINT AT 21,2: INK 4: BRIG
HT 1: " SCORE = ";sc: TAB 20:"TIM
E = ";t: "
50 IF INKEY$="B" THEN LET a
$=a$(2 TO )+a$(1)
60 IF INKEY$="5" THEN LET a
$=a$(8)+a$( TO 7)
70 LET f=1: GO SUB 200+(( VAL
a$(1))*10): GO SUB 300
80 IF x(1)>x(2) THEN LET b$=b
$(2 TO )+b$(1): GO TO 100
90 IF x(1)<x(2) THEN LET b$=b
$(8)+b$( TO 7)
100 LET f=2: GO SUB 200+(( VAL
b$(1))*10): GO SUB 300
110 PRINT AT a,b: PAPER 5: "
: AT a+1,b: " : AT c,d: " : AT
c+1,d: " : POKE 23675,m(2): PR
INT AT y(2),x(2): INK 2: PAPER
5:"AB": AT y(2)+1,x(2):"CD": POK
E 23675,m(1): PRINT AT y(1),x(1
): INK 4: PAPER 5:"AB": AT y(1)+
1,x(1):"CD": LET a=y(1): LET b=x
(1): LET c=y(2): LET d=x(2)
120 IF f=2 AND RAND <.1 THEN G
O SUB 600+(( VAL b$(1))*10)
130 IF INKEY$="0" THEN LET f
=1: GO SUB 600+(( VAL a$(1))*10)
140 LET t=t-1: PRINT AT 21,27:
INK 4: BRIGHT 1:t: " : IF t <=
0 THEN GO TO 1030
150 GO TO 50
200 LET y(f)=y(f)-1: LET m(f)=0
: RETURN
210 LET y(f)=y(f)-1: LET x(f)=x
(f)+1: LET m(f)=32: RETURN
220 LET x(f)=x(f)+1: LET m(f)=6
4: RETURN
230 LET x(f)=x(f)+1: LET y(f)=y
(f)+1: LET m(f)=96: RETURN
240 LET y(f)=y(f)+1: LET m(f)=1
28: RETURN
250 LET y(f)=y(f)+1: LET x(f)=x
(f)-1: LET m(f)=160: RETURN
260 LET x(f)=x(f)-1: LET m(f)=1
92: RETURN
270 LET x(f)=x(f)-1: LET y(f)=y
(f)-1: LET m(f)=224: RETURN
300 IF y(f)>12 THEN LET y(f)=3
310 IF y(f)<3 THEN LET y(f)=12
320 IF x(f)<3 THEN LET x(f)=27
330 IF x(f)>27 THEN LET x(f)=3
340 RETURN
500 FOR f=64000 TO 64255: READ
a: POKE f,a: NEXT f: RETURN
510 DATA 0,0,1,127,255,255,127,

```

```

11,0,0,128,254,255,255,254,208,7
,3,3,1,1,15,15,1,224,192,192,128
,128,240,240,128
520 DATA 12,30,31,15,7,7,5,7,0,
0,0,128,224,240,240,248,7,79,239
,126,56,124,46,4,252,190,255,15,
6,0,0,0
530 DATA 0,0,0,0,96,97,103,255,
48,120,120,120,248,120,248,252,2
55,103,97,96,0,0,0,0,252,248,120
,248,120,120,120,48
540 DATA 4,46,124,56,126,239,79
,7,0,0,0,6,15,255,190,252,7,5,7
,7,15,31,30,12,248,240,240,224,12
8,0,0,0
550 DATA 1,15,15,1,1,3,3,7,128,
240,240,128,128,192,192,224,11,1
27,255,255,127,1,0,0,208,254,255
,255,254,128,0,0
560 DATA 0,0,0,96,240,255,125,6
3,32,116,62,28,126,247,242,224,3
1,15,15,7,1,0,0,0,224,160,224,22
4,240,248,120,48
570 DATA 12,30,30,30,31,30,31,6
3,0,0,0,0,6,134,230,255,63,31,30
,31,30,30,30,12,255,230,134,6,0,
0,0,0
580 DATA 0,0,0,1,7,15,15,31,48,
120,248,240,224,224,160,224,63,1
25,255,240,96,0,0,0,224,242,247,
126,28,62,116,32
600 PLOT x(f)*8+8,176-y(f)*8: D
RAW INK 0;0,23: BEEP .001,40: G
O SUB 1000: PLOT OVER 1:x(f)*8+
8,176-y(f)*8: DRAW OVER 1;0,23:
BEEP .001,60: RETURN
610 PLOT x(f)*8+16,176-y(f)*8:
DRAW INK 0;23,23: BEEP .001,40:
GO SUB 1000: PLOT OVER 1:x(f)*
8+16,176-y(f)*8: DRAW OVER 1;23
,23: BEEP .001,60: RETURN
620 PLOT x(f)*8+16,168-y(f)*8:
DRAW INK 0;23,0: BEEP .001,40:
GO SUB 1000: PLOT OVER 1:x(f)*8
+16,168-y(f)*8: DRAW OVER 1;23,
0: BEEP .001,60: RETURN
630 PLOT x(f)*8+16,160-y(f)*8:
DRAW INK 0;23,-23: BEEP .001,40
: GO SUB 1000: PLOT OVER 1:x(f)
*8+16,160-y(f)*8: DRAW OVER 1;2
3,-23: BEEP .001,60: RETURN
640 PLOT x(f)*8+8,160-y(f)*8: D
RAW INK 0;0,-23: BEEP .001,40:
GO SUB 1000: PLOT OVER 1:x(f)*8
+8,160-y(f)*8: DRAW OVER 1;0,-2
3: BEEP .001,60: RETURN
650 PLOT x(f)*8,160-y(f)*8: DRA
W INK 0;-23,-23: BEEP .001,40:
GO SUB 1000: PLOT OVER 1:x(f)*8
,160-y(f)*8: DRAW OVER 1;-23,-2
3: BEEP .001,60: RETURN
660 PLOT x(f)*8,168-y(f)*8: DRA
W INK 0;-23,0: BEEP .001,40: GO
SUB 1000: PLOT OVER 1:x(f)*8,1
68-y(f)*8: DRAW OVER 1;-23,0: B
EEP .001,60: RETURN
670 PLOT x(f)*8,176-y(f)*8: DRA
W INK 0;-23,23: BEEP .001,40: G
O SUB 1000: PLOT OVER 1:x(f)*8,
176-y(f)*8: DRAW OVER 1;-23,23:
BEEP .001,60: RETURN
1000 IF f=1 THEN IF ATTR (y(2)
,x(2))+ ATTR (y(2),x(2)+1)+ ATTR
(y(2)+1,x(2))+ ATTR (y(2)+1,x(2)

```

```

)+1) <> 168 THEN GO TO 1090
1010 IF f=2 THEN IF ATTR (y(1)
,x(1))+ ATTR (y(1),x(1)+1)+ ATTR
(y(1)+1,x(1))+ ATTR (y(1)+1,x(1
)+1) <> 176 THEN GO TO 1030
1020 RETURN
1030 FOR g=0 TO 5: FOR f=0 TO 25
5 STEP 32: BEEP .001,40:g: PRINT
AT y(1),x(1): PAPER 5: INK g: "
AB": AT y(1)+1,x(1):"CD": BEEP .
001,60: POKE 23675,f: NEXT f: NE
XT g
1040 PRINT AT 5,4: BRIGHT 1: PA
PER 5: INK 2: " GAME OVER
"
1050 FOR f=0 TO 50 STEP 5: BEEP
.01,f: NEXT f
1060 FOR f=1 TO 4: BEEP .01,30:
FAUSE 5: BEEP .01,20: FAUSE 5: N
EXT f
1070 PRINT AT 7,10:"PRESS ANY K
EY": PAUSE 1
1080 PAUSE 0: GO TO 10
1090 BEEP .01,60: PRINT AT y(2)
,x(2): PAPER 5: " : AT y(2)+1,x
(2): " : LET sc=sc+t: PRINT AT
21,11: BRIGHT 1: INK 4:sc: LET
t=100: LET y(2)=5: LET x(2)=23:
RETURN
3000 PAPER 0: BORDER 0: CLS : PR
INT AT 2,8: INK 6: PAPER 0: BRI
GHT 1:"D O G F I G H T"
3010 LET n$=" IT IS THE 1st WOR
LD WAR.THE BATTLE FOR THE SK
Y WAS BEING WON BY THE GERMAN
S,AND IN PARTICULAR,BY THE
RED BARON. YOUR TASK IS TO S
HOOT HIM DOWN.
KEYS:5 LEFT ,8 RI
GHT ,0 FIRE"
3015 LET n$=n$+ " YOU LOSE A
LIFE IF YOU GET SHOT OR YOU
R TIME RUNS OUT YOU CONTROL
THE GREEN PLANE. GOO
D LUCK "
3020 POKE 23675,64: LET o=4: LET
p=0: FOR f=1 TO LEN n$: BEEP .
001,20: PRINT AT o,p: INK 5: BR
IGHT 1;n$(f): INK 4:"AB": AT o+1
,p: "CD": LET p=p+1: IF p=32 THE
N LET p=0: LET o=o+1
3030 NEXT f
3035 PRINT AT 19,0: FLASH 1: BR
IGHT 1: INK 6: PAPER 0: " FRE
SS ANY KEY TO START "
3040 PRINT AT o,p: " : AT o+1,
p: " : FAUSE 0: FAUSE 1: RETURN

```